1. A method for constructing a self-registering hologram, the method comprising:

providing a first photonic source characterized by a first wavefront of arbitrary shape and fixed at a first arbitrary source position in a frame having a first arbitrary frame location;

providing a second photonic source characterized by a second wavefront of arbitrary shape and fixed at a second arbitrary source position with respect to the frame;

directing energy from the first and second photonic sources to a first surface fixed at a first arbitrary surface location in the frame and comprising a photo-reactive material;

developing the photo-reactive material into a first hologram; and

re-locating the frame to a second arbitrary frame location, the frame continually maintaining in registration the first wavefront and the first hologram with respect to one another.

- 2. The method of claim 1, wherein developing further comprises reacting the photo-reactive material while in the frame.
- 3. The method of claim 2, wherein developing further comprises maintaining registration of the first surface with respect to the frame by immersing the frame and first surface in a developer medium.
- 4. The method of claim 1, wherein each of the first and second photonic sources further comprises a remote energy source, an input port, and a photonic transmission path extending therebetween.

- 5. The method of claim 4, wherein the photonic transmission path corresponding to the first photonic source further comprises a photonic fiber.
- 6. The method of claim 5, wherein the input port corresponding to the first photonic source further comprises an end surface of the photonic fiber.
- 7. The method of claim 6, wherein the end surface is configured in a non-selected, arbitrary shape configured to illuminate the first surface.
- 8. The method of claim 6, wherein the second photonic source is configured to emit a second beam, the first photonic source is configured to emit a first beam, and the first and second beams are configured to interact, creating an interference pattern of arbitrary at the first surface.
- 9. The method of claim 8, wherein developing further comprises immersing the input port, the frame and the first surface in a developing medium.
 - 10. The method of claim 1, wherein developing further comprises: removing the photo-reactive material from the frame; chemically reacting the photo-reactive material; and replacing the first surface in the frame.

- 11. The method of claim 1, further comprising providing a registration monument on the frame for automatically and repeatably registering the first surface thereagainst without requiring a measuring process.
- 12. The method of claim 1, wherein the first hologram is characterized by a first phase-modulation characteristic, and wherein the method further comprises providing a second hologram, self-registering in the frame and having a second phase-modulation characteristic different from the first phase-modulation characteristic.
- 13. The method of claim 12, wherein providing the second hologram further comprises: providing a second surface fixed at a second arbitrary surface location in the frame, and comprising a photo-reactive material;

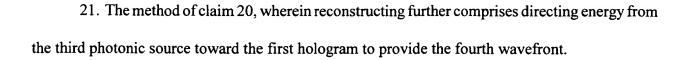
changing the relative phase between the first and second photonic surfaces; and directing energy from the first and second sources to the second surface; and developing the photo-reactive material of the second surface into second hologram.

14. The method of claim 13, further comprising forming a first holographic lens fixed to the frame.

- 15. The method of claim 14, wherein forming the first holographic lens further comprises directing energy of the second source from a location spaced from a first side of the first surface and focusing the energy at a first focal location spaced from a second side of the first surface and opposite the first side.
 - 16. The method of claim 15, further comprising forming a second holographic lens.
- 17. The method of claim 14, wherein forming the first holographic lens further comprises: directing energy of the second source toward the first surface and from a location spaced from a first side of the first surface; and

forming a virtual focus for the energy at a first virtual focal location spaced from the first side of the first surface.

- 18. The method of claim 17, wherein the first virtual focal location is spaced a substantially infinite distance from the first surface.
- 19. The method of claim 17, further comprising providing, subsequent to developing the photo-reactive material, a third photonic source providing a third wavefront substantially identical to the second wavefront and propagating in a direction opposite thereto.
- 20. The method of claim 19, further comprising reconstructing a fourth wavefront substantially identical to the first wavefront and propagating in a direction opposite thereto.



22. The method of claim 21, wherein:

the first source further comprises a remote energy source, a photonic interface surface, and a photonic transmission path extending therebetween; and

the photonic interface surface is configured to produce the first wavefront.

- 23. The method of claim 22, wherein reconstructing further comprises propagating the reconstructed fourth wavefront from the first hologram.
- 24. The method of claim 23, further comprising producing a fifth wavefront in the photonic transmission path by propagating the fourth wavefront into the photonic interface surface.

25. The method of claim 24, wherein:

directing energy from the first photonic source to the first surface further comprises propagating a sixth wavefront from the remote energy source to the photonic interface surface to produce the first wavefront; and

wherein the fifth wavefront is substantially identical to the sixth wavefront and propagated in a direction opposite thereto.



- 26. The method of claim 25, further comprising controlling energy transmitted from the third source into the fifth wavefront by controlling, by selective development of the first hologram, a diffraction efficiency corresponding to the first hologram.
- 27. The method of claim 26, wherein the photonic transmission path corresponding to the fifth wavefront further comprises a photonic fiber, and wherein the photonic interface surface is the end surface of the photonic fiber.
 - 28. The method of claim 27, wherein the end surface is of an arbitrary shape.
- 29. The method of claim 28, further comprising configuring the diffraction efficiency of the first hologram to have a value of greater than fifty percent in order to direct a portion greater than fifty percent of the energy from the third photonic source into the photonic fiber.